

measuring the ability of the treated autoinducer molecule to stimulate the activity of a selected gene;

determining whether the suspected inhibitor inhibits the ability of the autoinducer molecule to stimulate the activity of a selected gene; and

selecting the suspected inhibitors that inhibit the autoinducer molecule.

45. (New) A method of selecting synergists of the autoinducer molecule of *Pseudomonas aeruginosa* comprising:

contacting the autoinducer molecule with a suspected synergist;

measuring the ability of the treated autoinducer molecule to stimulate the activity of a selected gene;

determining whether the suspected synergist enhances the ability of the autoinducer molecule to stimulate the activity of a selected gene; and

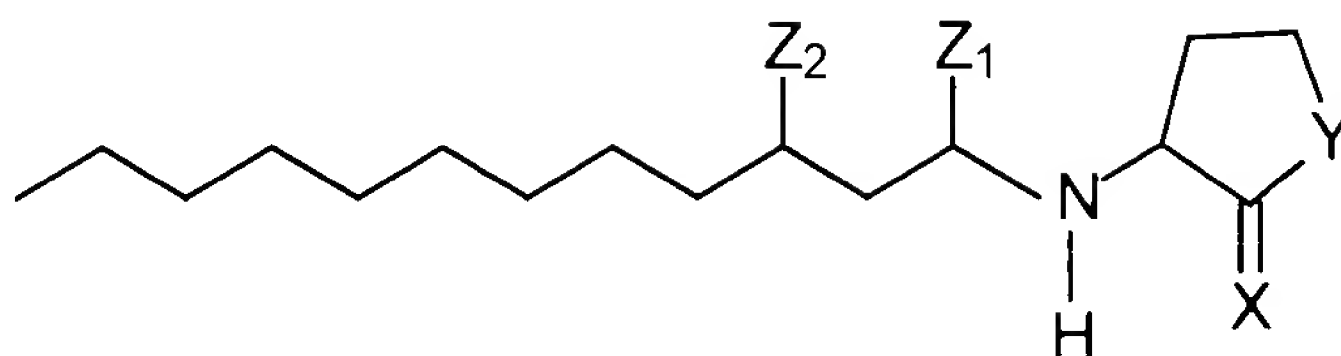
selecting the suspected synergists that enhance the activity of the autoinducer molecule.

46. (New) A culture medium containing as an added compound N-(3-oxododecanoyl)homoserine lactone at a concentration effective to stimulate or promote cellular metabolism, growth, or recovery.

47. (New) The culture medium of claim 46 wherein the cellular growth of *Pseudomonas aeruginosa* is stimulated or enhanced.

48. (New) A method of regulating the expression of a gene comprising:
inserting a gene into bacteria chosen for enhancement of gene expression by an agent that enhances the activity of the LasR protein; and
incubating the bacteria with an agent that enhances the activity of the LasR protein such that the expression of the gene is regulated.

49. (New) The method of claim 48, wherein the agent is a compound of the following formula:



wherein Y is O, S, or NH; X is O, S, or NH; and Z₁ and Z₂ are independently selected from the group consisting of hydrogen =O, =S, and =NH; the molecule being able to regulate gene expression.

50. (New) The method of claim 48. wherein the agent is N-(3-oxododecanoyl) homoserine lactone.

51. (New) The method of claim 48 wherein the method further comprises the additional steps of:

allowing the gene expression to reach a desired level; and
incubating the bacteria with an agent that inhibits the activity of the LasR protein regulating the gene expression by the bacteria.

52. (New) A method of regulating the expression of a gene comprising:
inserting a gene into a cell chosen for enhancement of gene expression by N-(3-oxododecanoyl)homoserine lactone; and
incubating the cell with N-(3-oxododecanoyl)homoserine lactone such that the expression of the gene is regulated.

53. (New) The method of claim 52 wherein the method further comprises the additional steps of:

allowing the gene expression to reach a desired level; and
incubating the cell with an agent that inhibits the activity
N-(3-oxododecanoyl)homoserine lactone regulating the gene expression by the cell.--